

# Monitoring the Indonesian Throughflow in Makassar Strait

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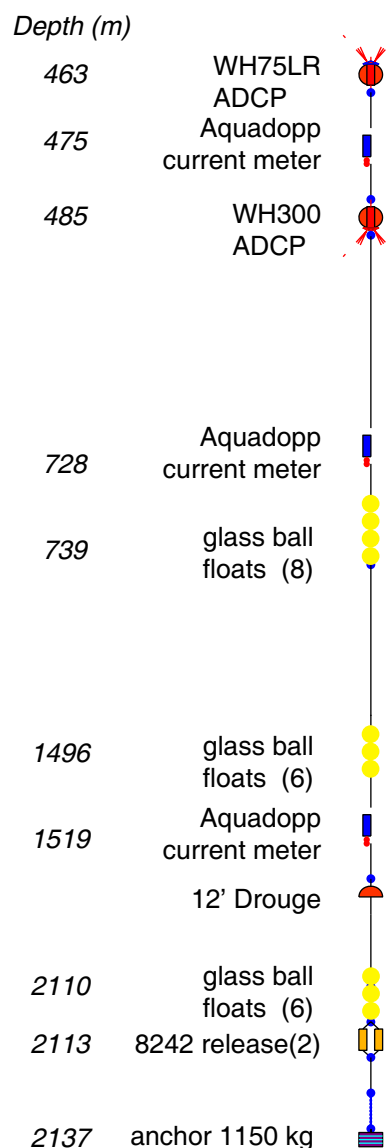
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## Project Summary

The Indonesian Throughflow (ITF) of Pacific water in to the Indian Ocean represents an important part of the ocean system of interocean fluxes. The ITF is believed to govern aspects of ENSO and the Asian monsoon. The ITF amounts to ~12 Sv, 80% of which is channeled through Makassar Strait. Within the Labani constriction of Makassar Strait near 3°S, the throughflow was measured during Arlindo program from December 1996 to July 1998, and during the INSTANT program from January 2004 to July 2005, and with the presently deployed INSTANT moorings, with planned recovery in November 2006. NSF funded both Arlindo and INSTANT. With NOAA OCO support a single mooring within Makassar Strait will be maintained after completion of the INSTANT array. The NOAA monitoring mooring will be deployed in November 2006. The NOAA mooring will be placed in the same location as the INSTANT MAK-WEST. A transfer function based on the Arlindo and INSTANT time series will allow the MAK-WEST data to be converted to a full Makassar ITF. The MAK-EAST is very close to a constant 80% of MAK-WEST along channel speeds.

The NOAA Mak Mooring: Building on experience gained from the Arlindo and INSTANT programs, we will install a simplified mooring with instruments placed well below the high-velocity core of the throughflow. The mooring will be instrumented as shown schematically in Figure 1. An upward-looking RDI Longranger ADCP will provide velocity profiles from approximately 500 m to near the surface, resolving the bulk of the throughflow velocity field without being subjected to the blowover associated with the large velocities in the thermocline. Additional current meters, including an RDI 300 kHz Workhorse ADCP, will provide velocity measurements throughout the remainder of the water column. Dual acoustic releases will be used to give an added measure of reliability. The ADCPs are mounted in syntactic foam buoys with in-line mooring cages. Backup flotation is provided by distributed glass ball floats in plastic hard hats.

All of the instruments will be equipped with battery and memory capacity for a 2 year deployment.



For the ADCPs, this entails using a sampling rate of one ensemble per hour. The Aquadopps will also be set for hourly sampling, but they can also record bursts of higher frequency samples for diagnostic purposes. The releases will be prepared for 4 year endurance.

The ADCPs, syntactic foam buoys, and Aquadopps current meters will be provided by LDEO after recovery of the INSTANT moorings. We are requesting funds to purchase 2 ORE 8242 acoustic releases, 20 17" Benthos glass ball floats, mooring line, shackles, batteries, anchor, and related hardware which will not be available from recovery of the INSTANT moorings.

Cost of shipping the new materials to Indonesia will be absorbed by the INSTANT program, since we must send a container for that program anyway, and adding the materials to that shipment will have no impact on the total cost of the shipment. We do anticipate, however, that due to the tight schedule, there will be some items requiring airfreight, for which we have budgeted.

Deployment will be carried out from the Indonesian research vessel Baruna Jaya I, during the INSTANT recovery cruise on approximately 25 November 2006, directly after the final recovery of the two INSTANT Mak moorings.